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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/471,460	12/22/1999	Thomas A Figura	94-0280.03	7429

7590 08/12/2002
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EXAMINER

LEE, CALVIN

ART UNIT PAPER NUMBER

2825

DATE MAILED: 08/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.
09/471,460

Applicant(s)
FIGURA et al.

Examiner
Calvin Lee

Art Unit
2825



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on June 24, 2002 (Amendment E)

2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 45 and 46 is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 45 and 46 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirements.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

4) ☐ Interview Summary (PTO-413) Paper No(s). _____

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

5) ☐ Notice of Informal Patent Application (PTO-152)

3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 22

6) ☐ Other: _____

FINAL ACTION

Response to Amendment

1. The amendment of claims 45 and 46 dated June 18, 2002, is acknowledged.

Claim Rejections - 35 USC § 112

2. Claims 45-46 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

No support for “etching *said material* in the same general site used to perform said deposition, wherein said step of etching further comprises etching generally simultaneously with performing said deposition”, because the specification expresses that “an etching resistant layer **80** can be formed within the contact **14** while, simultaneously, the conductive layer **20** is etched” [page 8, line 14]. The material to be etched differs from the material to be formed/deposited.

Claim Rejections - 35 U.S.C. § 102

3. Claims 45-46 are rejected under 35 U.S.C. 102(b) as being anticipated by *Chouan et al* (US 5,079,178).

Chouan discloses a method of forming a polymer between features **106**, **108** inside a plasma chamber (using CH₄, H₂, and Ar as plasma etchant gases), comprising the steps of:

- performing a deposition of a polymer film **110** on a wafer **100** in a site [Fig. 1c and col. 3]
- etching in the same site simultaneously with performing the deposition

4. Claims 45-46 are rejected under 35 U.S.C. 102(e) as being anticipated by *Nulty (EP 721,205)* or *Imai et al (US 6,089,183)*.

a) *Nulty* discloses a method of forming a polymer between features on a wafer inside a plasma chamber [col. 9, lines 10-41], comprising the steps of:

- etching an insulator **501** to form a recess **521**, **522** (using CHF_3 and C_2F_6 as etchant gases simultaneously with performing a deposition of a polymer resist layer **1107** inside the recess [Figs 7, 10A, 10B, 11 and cols. 11-13]
- etching the resist layer out from the wafer [col. 15, lines 3-15]

b) *Imai* teaches or suggests a method of forming a polymer within a recess inside a single high density plasma chamber [Figs. 1, 10, and 16], comprising the steps of:

- etching an insulator **1** to form a recess **7** (using CHF_3 , CF_4 , ClF_3 , and CH_2F_2 as etchant gases) simultaneously with performing a deposition of a polymer resist layer inside the recess [Figs. 2b, 3a and col. 12, line 26 through col. 13, line 25]
- etching the resist layer out from the wafer surface using parameters known in the art [Figs. 3a-3b and col. 12, line 9]

Imai discloses a plurality of ways that have been developed to create a trench so as to make a contact via in a semiconductor circuit. One such way is taught in column 3, lines 19-43, wherein the wafer is placed in a plasma source chamber and exposed to a plasma. A mixture gas ("feed gas") is used including CF_4 , CHF_3 , etc. In creating the contact hole (or via) in the plasma dry etching procedure, the reference at the above location teaches that inherently a polymeric film is created by plasma polymerization resulting in the deposition of a polymer film on the etched portion including the sidewalls. Upon completion of the holes, metal is inserted so as to create the electrical contact for transmission of an electrical signal. The absence of the polymer can be

done by either subsequential removing the polymer or by using different gases (as suggested by *Imai* in another embodiment).

Therefore, a polymeric layer is provided between the metal lines using the feed gas and each and every claimed element is found in *Imai* (meets claim 45).

Response to Arguments

5. The rejections of claims 20-22 based on 35 USC 112, second paragraph have been withdrawn because claims 20-22 are not pending in this application.

Examiner intended to take issue with claim 45 for the use of the phrase “metal features”. In response to Applicant’s argument, Examiner contends that there is sufficient disclosure to support the phrase “metal features”.

Applicant’s argument that both the publication date and filing date of the European Nulty reference are later than the priority date of the current application is persuasive. However, its priority date (7/12/94 US 351,784) is earlier than that of this application.

Applicant argued that Chouan, Nulty, and Imai fail to disclose claim 45’s limitations. Admittedly none of the references teaches or suggests “etching that material in the same general site used to perform the deposition, wherein etching further comprises etching generally simultaneously with performing the deposition”. However, the specification [page 8] expresses only that performing a deposition of an etch resistant layer **80** within a contact **14** while , simultaneously, a preformed conductive layer **20** is etched from the surface of the wafer. Nowhere in the specification teaches or suggests such limitation as etching *that material* (the

same material that has been deposited through plasma etching process) simultaneously with performing the deposition of that material.

In conclusion, Applicant's arguments are moot in light of the enclosed final rejection.

6. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire three months from the mailing date of this action. In the event a first reply is filed within two months of the mailing date of this final action and the advisory action is not mailed until after the end of the three-month shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than six months from the mailing date of this final action.

Any inquiry concerning this communication from the Examiner should be directed to *Calvin Lee* at 703-306-5854, Monday to Thursday, from 7 to 5 (Eastern Time). If attempts to reach the examiner by telephone are unsuccessful, Art Unit 2825's Supervisory Patent Examiner *Matthew Smith* whose telephone number is 703-308-1323.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

CL

August 8, 2002

C. Rueschman
GIVEN BY
PRIMARY EXAMINER